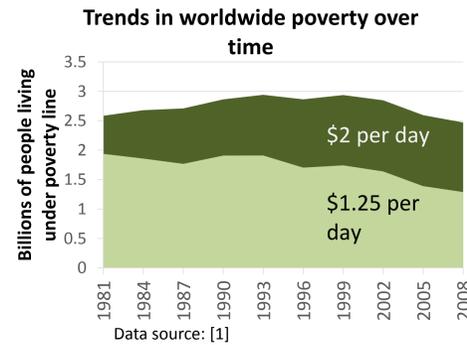


# Why Crowdsourcing-Based Work Will Eliminate Global Poverty

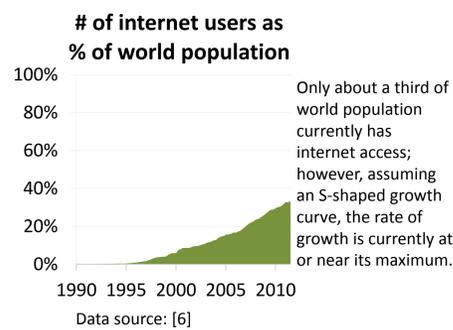
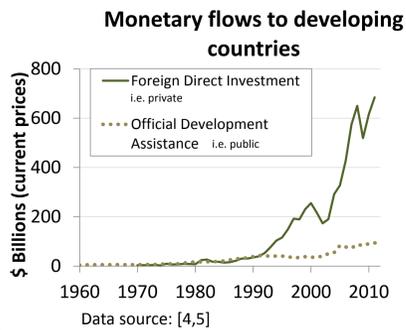
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## introduction

- In 2008, **2.4 billion people still lived on less than \$2 per day.** (figure, right)
- This type of extreme poverty is characterized by the **poverty cycle** – mutually reinforcing deficits in basic needs like water, food, and health care
- Jeff Sachs argues that the poor need assistance to get out of the poverty cycle and onto the bottom rung of the ladder of growth [2]
- William Easterly argues that aid handouts create damaging incentives, and instead we must align individuals' incentives with large scale goals [3]
- In any case, private flows dwarf aid (figure, left)
- Internet use is rapidly expanding globally (figure, middle)
- Using crowd work as a solution leverages existing trends for maximum impact**
- Crowd work provides help to get onto the ladder of growth, without creating damaging incentives



This is what extreme poverty looks like: instead of being in school, girls are collecting water from a contaminated pond.



## pilot project in Kenya

### Feasibility study in Kamuga, Kenya using our PulaCloud platform

Questions:

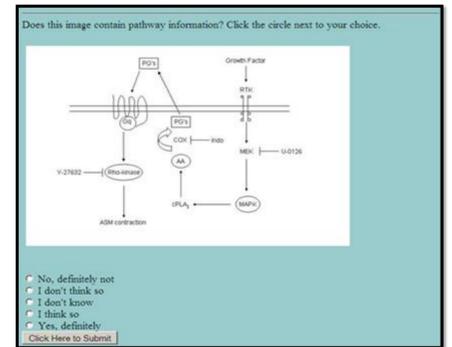
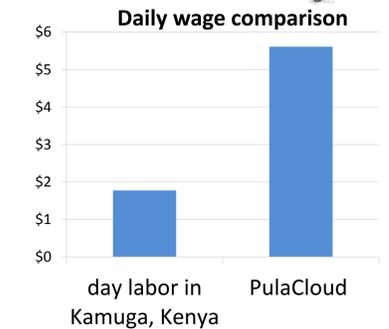
- Does the price of crowd labor make sense for workers and requesters?
- Can people living in extreme poverty successfully complete crowd work?
- How will the workers spend the income?** (panel below)

- 64% of the region's residents live below \$2 per day poverty line
- Income surveys indicate \$2-\$3 per day is a **good wage**

- Used 4 netbooks, solar panels, and a car battery
- Recruited 7 English-speaking workers (4 male, 3 female, ages 19-46)
- 3 workers had never used a computer before

### Example crowd app: Image mining and biochemical pathway mapping

- Identifying biochemical pathway diagrams from the medical literature for data mining (screenshot, right)
- Workers were trained in 15 minutes
- ~28,000 images were assessed, and ~100,000 judgments were collected
- A minimum of 3 judgments per image were collected for redundancy
- Workers were paid **\$2000** split according to their contributions
- Individual payments ranged from \$160 - \$514



## crowdsourcing work explained aka crowd work

- Crowdsourcing** "represents the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call" [7]
- Related terms: **human computation, microtasking**
- "we treat human brains as processors in a distributed system, each performing a small part of a massive computation" [8]
- Crowdsourcing can be used to do high volume data processing that is hard for computers, like a **knowledge work assembly line**:

- Transcribe text
- Caption audio
- Identify objects in images
- Classify products
- Grade papers
- and more!

"The Future of Crowd Work" – all work will be distributed, scalable, on demand, and matched to the expertise of the worker [9]

- Over the past 10 years, 1 million crowd workers earned a total of \$2 billion [10]
- The crowdsourcing industry grew revenues by 75% in 2012 [11]
- "high growth, early stage industry" [11]

Does this look familiar? You've been doing "crowd work" (for free) already!



Some of the many crowdsourcing platforms:



Crowdsourcing industry revenue growth 2009-11



Figure reprinted from [11]



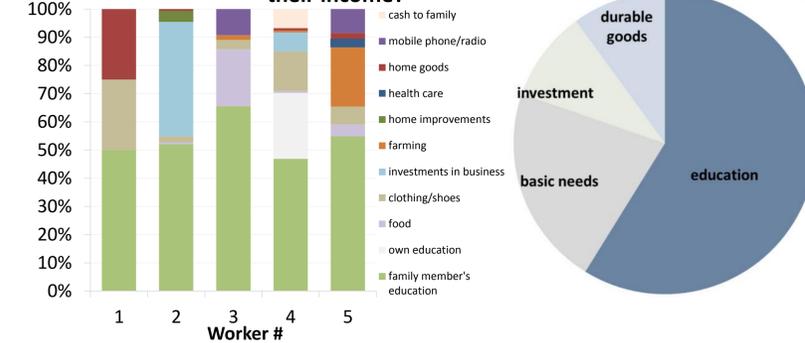
Our crowdsourcing platform, developed with an explicit focus on making work accessible to people living in poverty

## results

- 6 months\* after completion, we surveyed 5 of the 7 workers\* about how they spent their income
- Each worker spent over 50% of the income on education**
- All of the income was spent on useful ends\***
- A subset of 10% (2800) images were classified by an expert as a "gold standard" for measuring worker accuracy (see table)

Classification accuracy metrics		
Precision	Recall	Overall Accuracy
0.77	0.94	0.92

### How do PulaCloud workers spend their income?

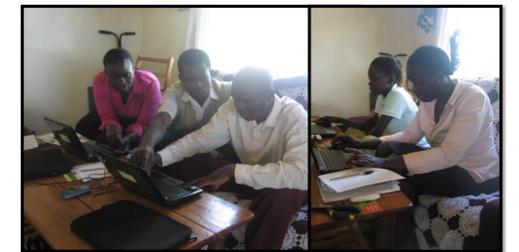


## conclusions

- Crowd work is beneficial for both workers and requesters
- The income from this employment can address deficits in a variety of basic needs
- Crowd work has **dramatic potential to reduce poverty by providing immediate employment**

\* The other 2 workers had moved away.

\*We hesitate to make normative judgments about spending, but it is hard to argue that the income was not well spent.



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## acknowledgements

- Support provided by a National Science Foundation Graduate Research Fellowship
- Bruce Aronow & Anil Jegga
- The PulaCloud workers